

WHAT IS CLAIMED IS:

1. A perfluoride compound processing apparatus, comprising:

a silicon component removing apparatus for removing a silicon component from an exhaust gas containing a perfluoride compound and said silicon component,

a heating apparatus for heating said exhaust gas containing said perfluoride compound, to which at least one of water and steam is added after said exhaust gas has been exhausted from said silicon component removing apparatus,

a catalyst layer filled with a catalyst for decomposing said perfluoride compound contained in said exhaust gas exhausted from said heating apparatus, and

a cooling apparatus for cooling said exhaust gas exhausted from said catalyst layer.

2. A perfluoride compound processing apparatus as claimed in claim 1, which further comprises:

a temperature detector for detecting a temperature of said exhaust gas exhausted from said catalyst layer, and

a controller for controlling said heating apparatus based on the temperature detected by the temperature detector.

3. A perfluoride compound processing apparatus as claimed in claim 1, which further comprises:

an acidic gas removing apparatus for removing acidic gas contained in said exhaust gas exhausted from said cooling apparatus.

4. A perfluoride compound processing apparatus as claimed in claim 1, wherein said silicon component removing apparatus comprises a spray apparatus for spraying water.

5. A perfluoride compound processing apparatus as claimed in claim 4, wherein said cooling apparatus comprises a spray apparatus for spraying cooling water for cooling said exhaust gas.

6. A perfluoride compound processing apparatus as claimed in claim 5, wherein:

said silicon component removing apparatus comprises a first silicon component removing apparatus, and a second silicon component removing apparatus to which said exhaust gas from said first silicon component removing apparatus is supplied,

a first spray apparatus for spraying water provided inside said second silicon component removing apparatus, and

a second spray apparatus for spraying both water sprayed from said first spray apparatus and water

sprayed from said spray apparatus of said cooling apparatus.

7. A perfluoride compound processing apparatus as claimed in claim 1, wherein a check valve, for preventing said exhaust gas from flowing back into said silicon component removing apparatus from said heating apparatus, is provided in a path conducting said exhaust gas from said silicon component removing apparatus to said heating apparatus.

8. A perfluoride compound processing apparatus as claimed in claim 1, wherein said heater, said catalyst layer, and said cooling apparatus are formed in an integral body structure in the above order.

9. A perfluoride compound processing apparatus as claimed in claim 8, wherein:

said integral body structure is formed by arranging said heater, said catalyst layer, and said cooling apparatus in a horizontal direction, and a baffle member for disturbing a flow of undecomposed perfluoride compound is provided at a portion above said catalyst layer.

10. A perfluoride compound processing apparatus as claimed in claim 1, wherein a heat exchanger for exchanging heat between the exhaust gas exhausted from

said catalyst layer and water, and for generating said steam, is provided between said catalyst layer and said cooling apparatus.

11. A perfluoride compound processing apparatus as claimed in claim 1, further comprising:

a cartridge having said catalyst layer formed inside; and

a casing wherein said cartridge is removably attached,

wherein said heater, said casing, and said cooling apparatus are formed in an integral body structure in the above order.

12. A perfluoride compound processing apparatus as claimed in claim 11, further comprising a reactor which comprises said cartridge, an internal tube wherein said cartridge is contained, and said casing, and wherein said casing of said reactor is shared with a casing of said heater.

13. A perfluoride compound processing apparatus as claimed in claim 4, wherein:

an exhaust gas inlet portion for supplying said exhaust gas containing a perfluoride compound and a silicon component to said silicon component removing apparatus is extended into said silicon component removing apparatus, and

a gas outlet opening of said exhaust gas inlet portion is provided at a position lower than said spray apparatus of said silicon component removing apparatus, and said gas outlet opening is oriented downwards in said silicon component removing apparatus.

14. A perfluoride compound processing apparatus as claimed in claim 13, wherein a diffusion portion for diffusing sprayed water from said spray apparatus of said silicon component removing apparatus is provided inside said silicon component removing apparatus between said spray apparatus of said silicon component removing apparatus and said exhaust gas inlet portion.

15. An exhaust gas processing apparatus for a semiconductor manufacturing apparatus, comprising:

a silicon component removing apparatus for removing a silicon component from an exhaust gas containing a perfluoride compound and said silicon component;

a heating apparatus for heating said exhaust gas containing said perfluoride compound, to which any one of water and steam is added after said exhaust gas has been exhausted from said silicon component removing apparatus;

a catalyst layer filled with a catalyst for decomposing said perfluoride compound contained in said exhaust gas exhausted from said heating apparatus; and

a cooling apparatus for cooling said exhaust gas exhausted from said catalyst layer.

16. An exhaust gas processing apparatus for a semiconductor manufacturing apparatus as claimed in claim 15, wherein:

said heating apparatus, said catalyst layer, and said cooling apparatus are formed in an integral body structure in the above order, and

said integral body structure of said heating apparatus, said catalyst layer, and said cooling apparatus is installed in a building where said semiconductor manufacturing apparatus is installed.

17. A perfluoride compound processing apparatus, comprising:

a silicon component removing apparatus for removing a silicon component from an exhaust gas containing a perfluoride compound and said silicon component;

a heating apparatus, downstream of the silicon component removing apparatus in a direction of flow of the exhaust gas, for heating said exhaust gas containing said perfluoride compound, to which at least one of water and steam is added after the exhaust gas has exited said silicon component removing apparatus, the heating apparatus being arranged in a casing;

a catalyst layer filled with a catalyst for

decomposing said perfluoride compound contained in heated exhaust gas from the heating apparatus, the catalyst layer being arranged detachably in the casing at a downstream side of said heating apparatus in the direction of flow of the exhaust gas; and

a cooling apparatus arranged at a downstream side of the casing from the catalyst layer, in the direction of flow of the exhaust gas, for cooling said exhaust gas containing a decomposed gas generated by decomposition of said perfluoride compound by said catalyst layer.

18. A perfluoride compound processing apparatus as claimed in claim 17, wherein:

said heating apparatus is arranged in an upper region of said casing,

said catalyst layer is arranged in a lower region of said casing in a manner that said catalyst layer is removable in a lower direction from the casing, and

said cooling apparatus is arranged detachably in the casing at the lower region of the casing.

19. A perfluoride compound processing apparatus, comprising:

a silicon component removing apparatus for removing a silicon component from an exhaust gas containing a perfluoride compound and said silicon

component, exhausted from a semiconductor manufacturing apparatus;

a heating apparatus, downstream of the silicon component removing apparatus in a direction of flow of the exhaust gas, for heating said exhaust gas containing said perfluoride compound, to which at least one of water and steam is added after the exhaust gas has exited said silicon component removing apparatus, the heating apparatus being arranged in a casing;

a catalyst layer filled with a catalyst for decomposing said perfluoride compound contained in heated exhaust gas from the heating apparatus, the catalyst layer being arranged detachably in the casing at a downstream side of said heating apparatus in the direction of flow of the exhaust gas; and

a cooling apparatus arranged at the downstream side of the casing from the catalyst layer, in the direction of flow of the exhaust gas, for cooling said exhaust gas containing a decomposed gas generated by decomposition of said perfluoride compound by said catalyst layer.

20. A perfluoride compound processing apparatus as claimed in claim 19, wherein:

said heating apparatus is arranged in an upper region of said casing,

said catalyst layer is arranged in a lower region of said casing in a manner that said catalyst

layer is removable in a lower direction from the casing,
and

said cooling apparatus is arranged detachably
in the casing at the lower region of the casing.